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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,431	02/22/2002	Wei Zhang	SUN-P6557	6363

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EXAMINER

HE, AMY

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 03/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/082,431	Applicant(s) ZHANG, WEI	
	Examiner Amy He	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment dated 21 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-19 and 21-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-19 and 21-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2858

decode received signals from a particular resistor 14 and control signals corresponding to the particular resistor 14 under test and providing an output signal);

said at least one DUT including at least one test strip of a metal under test (12),
said at least one test strip formed from a series of segments of the metal (14) under test each has a unique length.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 5-19 and 21-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U. S. Patent No. 5, 9000, 735), in view of Fetterman et al. (U. S. Patent No. 2003/0080766).

Referring to claim 1, Yamamoto discloses an apparatus for determining the critical length of a conductor (in Figures 1 and 10; column 6, line 59 - column 7, line 47) comprising:

a device under test (6);

said at least one DUT including at least one test strip of a metal under test (6),
said at least one test strip formed from a series of segments of the metal (3 and 4)
under test.

Yamamoto does not specifically disclose a decoder and selection circuitry for each said DUT.

Fetterman discloses a decoder and selection circuitry (in Figures 5-7).

Since it has been held to be within the general skill of a worker in the art to select a known tool for a known purpose on the basis of its suitability for the intended use as a matter of obvious design choice *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA), it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Yamamoto to use the known tool of the decoder and selection circuitry, as taught by Fetterman, in order to electrically stepping through the plurality of DUTs and selectively testing a particular device under test in a short time period.

Referring to claims 14 and 16, Yamamoto discloses an apparatus/method for determining the critical length of a conductor (in Figures 1, 7-8 and 11-15; column 6, line 59 - column 7, line 47) comprising:

testing means (1) for providing a test signal (stress current) to at least one DUT (2 or 6), said at least one DUT (6) including at least one test strip (2 or 6) of a metal under test, said at least one test strip (6) formed from a series of segments of the metal (3 and 4) under test;

means (external current source, column 6, lines 59-60) for providing a test signal to said testing means (1);

means (external resistance measurement equipment, column 11, lines 16-17; or the whole test structure) for sensing an output signal from said testing means; and

means (test structure as shown in Figures 1-2, 7-8 and 11-15) for determining the critical length (column 7, lines 34-column 8, line 10) of a conductor from said output signal.

Yamamoto does not specifically disclose a decoder and selection circuitry for each said DUT.

Fetterman discloses a decoder and selection circuitry (the selection circuitry as shown in Figures 5-7).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Yamamoto to use a decoder and selection circuitry, as taught by Fetterman, for the same reasons as stated above for the rejection of apparatus claim, claim 1.

Referring to claims 2, 18, Yamamoto discloses a plurality of DUTs each has a unique length (see plurality of DUT 6 in Figure 10).

Referring to claims 3,15,17 and 19, Yamamoto discloses detecting electromigration in said DUT using Blech's Law (column 7, lines 34-65).

Referring to claims 5-6 and 21-22, Yamamoto discloses that the testing means (1) is embodied within an integrated circuit (column 6, lines 52-56) mountable on a hot chuck.

Referring to claims 7 and 23, Yamamoto discloses that metal strips (2 or 6) can have any size and length (column 7, lines 3-4). Yamamoto does not specifically disclose that the metal strips have a length ranging from 10um to 320um. It would have been obvious to a person of ordinary skill in the art at the time of the invention to further

modify the metal strips of Yamamoto's to have a length ranging from 10um to 320um or any other ranges depending upon the application, in order to test metal strips having the particular length of 10um to 320um, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 220 F. 2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Referring to claims 8 and 24, Yamamoto discloses that the metal strips are coupled together with segments of a connecting metal (3 or 4).

Referring to claims 9 and 25, Yamamoto discloses that the metal strips are coupled together with segments of a connecting metal (3 in Figures 1 and 8 or 17 in Figures 11-13 and 15) wherein the connecting metal (17) is approximately three times wider (see 17 in Figures 11-13 and 15) than the corresponding metal strips (4).

Referring to claim 10-12 and 26-28, Yamamoto discloses that the metal strips and the connecting metal are coupled with vias (5) formed of an electromigration resistant metal, such as tungsten (column 7, lines 14-16).

Referring to claims 13 and 29, Yamamoto discloses detecting a rising voltage drop (column 7, lines 58-60; Figures 3B and 4B) across the metal strips under test.

Response to Arguments

5. Applicant's arguments with respect to claims 1- 3, 5-19 and 21-29 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amy He whose telephone number is (571) 272-2230. The examiner can normally be reached on 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571) 272-2233. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

AH
February 19, 2004


N. Le
Supervisory Patent Examiner
Technology Center 2800